614.542
Sm5tu

Smith, Frederick Charles

Tuberculosis; its predisposing causes.

Return this book on or before the **Latest Date** stamped below. A charge is made on all overdue books.

University of Illinois Library

NOV 23 1951

L161—H41

UNITED STATES PUBLIC HEALTH SERVICE

MAR 1914

TUBERCULOSIS

ITS PREDISPOSING CAUSES

BY

F. C. SMITH

Passed Assistant Surgeon
United States Public Health Service

SUPPLEMENT No. 3
TO THE
PUBLIC HEALTH REPORTS

FEBRUARY 7, 1913

WASHINGTON
GOVERNMENT PRINTING OFFICE
1913

614.542
Sm5tu

21 Ja 15 DEAN

TUBERCULOSIS.

ITS PREDISPOSING CAUSES.

By F. C. Smith, Passed Assistant Surgeon, United States Public Health Service.

The public is already fairly well instructed concerning the exciting cause of tuberculosis, i. e., the tubercle bacillus. It is common knowledge that sputum containing this germ is the chief means of spreading infection. Spray from a coughing consumptive, dust, flies, doorknobs, drinking cups, and towels are common means of spreading infection. There are constantly over 1,000,000 people in the United States sick with tuberculosis, many of whom are careless or ignorant. There are also other sources of infection. As a result the tubercle bacillus is everywhere, and in spite of all precautions the ordinary individual at an early age is already slightly infected with tubercle bacilli.

INFECTION PRACTICALLY UNIVERSAL BY THE SIXTEENTH YEAR.

If a drop of tuberculin is rubbed into the abraded skin of a very young child no reaction follows. If the drop of tuberculin be rubbed into the skin of a person who is or has been infected with tuberculosis a reaction follows in a few hours, manifested by a small area of redness, which disappears after a few days and is unattended by any harmful effects. This is the cutaneous tuberculin test of Von Pirquet.

It was soon found that hundreds of people reacted to the tuberculin test who had no sign of tuberculosis. About 90 per cent of white children between the ages of 12 and 13 and practically all adults will give positive reactions, but the children of different communities give slightly different results. The Indians of Taos, N. Mex., an isolated community, were found during the recent investigation of disease among the Indians by the United States Public Health Service to be almost free from tuberculosis, and only 3 of the 64 school children tested there showed positive reactions. Of 1,145 other Indian school children tested, however, 779 reacted positively. We must conclude that the community free from almost universal infection is rare. The examination of large numbers of bodies dead

77411°—13

from other causes than tuberculosis in various parts of the world has shown, at the hands of numerous investigators, that a small area of healed or latent tuberculosis can almost always be found in the adult.

TUBERCLE BACILLI HARMLESS UNDER CERTAIN CONDITIONS.

Most of the children who react to the tuberculin test are not only apparently healthy but never break down from tuberculosis, although they have been the recipients of a large or small dose of living tubercle bacilli. Practically all adults are infected to some degree with tubercle bacilli and though many develop tuberculosis, especially during their years of greatest stress, the majority successfully resist it. It will at once occur to the reader that infection is perhaps a matter of dosage, that a large number of virulent bacilli inhaled or ingested may cause tuberculosis in an individual, whereas a small dose will be rendered innocuous by a high degree of resistance from a virile body. This is undoubtedly true. There is even a certain measure of protection derived from a small dose of tubercle bacilli well resisted.

These latent germs of infection, the potential factors of tuberculosis, in themselves probably give a certain degree of immunity against the effects of larger doses which one may later unfortunately experience. The individual is in a small degree vaccinated against tuberculosis. Too much comfort must not be derived from this, however, as in young children infection of any degree is apt to become generalized and rapidly fatal, and large dosage due to repeated exposures will cause even an adult to succumb. Hence no sanitary precaution should be neglected at any age to reduce the frequency and extent of exposure to tubercle bacilli. It must be remembered also that these bacilli of latent infection are nevertheless living bacilli capable of remaining virulent in the living body for many years and that the apparently healthy host may lose his immunity to them in several ways, many of which are not well understood. The most common ways of losing immunity and the ones most easily prevented are those discussed in this paper—the predisposing causes of tuberculosis.

WEAKENED RESISTANCE OR PREDISPOSITION.

In very early times it was observed that tuberculosis is more apt to occur at certain ages and under certain conditions of life. Hippocrates, the father of medicine, noted that it was most frequent between the ages of 18 and 35, a period which calls for the greatest physical and mental efforts. Dr. Bonney mentions "the old English idea that consumption was the cause of death of nearly all hard zealots in the field of letters, law, love, medicine, and religion." It is common knowledge now among physicians that any cause which weakens the

individual, lessens his resistance and predisposes to tuberculosis. A powerful physique is no safeguard. Bridge says: "Physically strong people will not resist tuberculosis better than less muscular subjects. Athletes acquire it rather more readily than thin, weakly people with spare musculature but normal organic vigor." Baldwin states: "Adults of good physique, in functional and organic health, possess a nearly perfect protection against natural infection by tubercle bacilli," but adds, "Any weak moment * * * may play the part of a predisposition." To maintain normal vigor and functional health requires the observance of a multitude of details and a consideration of the chief causes of lowered vitality.

LACK OF PROPER FOOD.

The well fed resist tuberculosis well, the underfed yield readily. Clinical observations have abundantly proved this fact in both man and animals. Actual want is by no means the commonest cause of poor nourishment although it must be reckoned with, especially in our great cities, such as New York, where it is said many hundred school children go breakfastless to school. In the average American household too little time is given to the study of children's diet during the first decade of life and even when food is properly prepared for them it must not be forgotten that it often takes time and patience to induce a playful and capricious child to eat the proper things in sufficient quantities. Every attack of indigestion, every missed or partially consumed meal has its adverse effect on nutrition at any age of life. Many people are underfed who consider themselves well fed. The rich business man who hastily consumes a scanty breakfast of toast and coffee and works hard all day in an office with only a hasty lunch at noon, can not consider himself well fed even though he consumes a full meal in the evening and has a late lunch after the theater. His child who refuses at table wholesome articles of food, such as bread and butter, vegetables and meat, can not maintain a satisfactory degree of nourishment. Candy and cookies taken between meals, and frequently accountable for the lack of appetite at table, can not possibly be considered a satisfactory substitute for proper food.

A lack of knowledge of food values is very common, especially in cities where delicatessen products made to tempt the eye and palate too often in the busy urban life take precedence over wholesome soups, roasts, and stews from the home kitchen. It should not be forgotten that fatty articles of food, including butter, fat meats, and olive oil are especially valuable in building up resistance to tuberculosis, but the diet must be suited to the age of the individual. Bread and butter, meat, and abundant vegetables must not be slighted simply because milk and eggs are so commonly mentioned in this connection as ideal foods.

EXHAUSTION.

Next to lack of food, great fatigue is the greatest predisposing factor in tuberculosis. Exhaustion may be produced by long hours of heavy work and also by lack of sleep, by worry, long hours of study and any excessive or prolonged exertion, either work or play. Dancing in itself is harmless, but if it comes at the end of a day's work and is indulged in until late hours its effects upon general health will be deleterious. Even outdoor sports, which are certainly to be encouraged, may defeat their chief end if indulged in immoderately or to the exclusion of proper resting periods. Child labor, either in factory or at home, excessively long working hours, occupations which can not be interrupted for Sunday rest or which tempt or drive to excessive effort or "speeding up," all tend to weaken resistance and predispose to tuberculosis.

BAD AIR.

The air of poorly ventilated rooms is bad. Not only in factory and workshop and in overheated, poorly ventilated places of amusement, but in his own home, the ordinary individual frequently lacks good air. When air is breathed and rebreathed it becomes laden with poisonous matters. A person fresh from the pure outdoor air will feel oppressed upon entering such an atmosphere and will notice a bad odor in the room. When he goes forth he will carry the taint of such a place in his garments. One who lives long in vitiated air grows pale, loses appetite, takes cold easily, and becomes tired upon slight exertion. If several people occupy the room, or if gas or oil is burned in it, the contained air rapidly becomes highly polluted unless it is frequently renewed. The effect of bad air and lack of sunshine on infected rabbits has been studied by Dr. Trudeau, who found that animals confined in a cellar died of tuberculosis, while similarly infected ones recovered in the open air. Remembering that many babies, most children, and all adults are infected with tubercle bacilli, and knowing the fatal effects of close confinement, the need of good ventilation becomes imperative.

Air flows very much as water does; to renew itself in a room it should have an inlet and an outlet. A bucket of dirty water half imersed in a flowing crystal stream remains dirty. A small trickle of clear water will not cleanse a pond constantly receiving pollution from another source. A room must be well flushed with flowing air to sweep out pollution, and the flow should be constant both in summer and winter. Ventilation at night is most important, the fear of night air being without any foundation. With sufficient bedclothes there can be no excuse for leaving even partially closed a single window in the room.

OTHER DISEASES.

It has long been known that measles and whooping cough in children are especially liable to be followed by tuberculosis of the lungs, and every effort should be made to protect a child from these diseases. Mouth breathing should be corrected and adenoids removed. Scarlet fever, influenza and colds, typhoid fever, and all diseases which lower resistence, lessen nourishment, and increase the stress of life at any age must be reckoned with as important factors in predisposing to tuberculosis.

ALCOHOL AND TOBACCO.

There was a time when whisky was considered good for the tuberculous patient, and there have been some who believed in the antiseptic powers of smoke. It is now known and taught that neither of these agents has any place in the prophylaxis or treatment of this disease. The inhaled smoke of cigarettes is especially harmful to the delicate air passages as well as weakening in its effects on the system. Alcohol in immoderate quantities impairs digestion, encourages irregular habits, and seems to especially predispose the subject to pulmonary disease.

SUMMARY.

At an early age practically all people have become slightly infected with living tubercle bacilli. This fact need not cause alarm, because it probably gives a slight degree of protection against subsequent infection. Safety, however, depends on the maintenance of a high degree of organic resistance to prevent these latent bacilli from producing active tuberculosis. This is not to be accomplished by becoming an athlete but by the daily observance of general hygienic principles throughout life. Keep the body well nourished; avoid great fatigue; work and sleep in well-ventilated rooms, in freely flowing air, and spend as much time as possible outdoors, but carefully reserve hours for adequate rest as well as for recreation; practice deep breathing and proper carriage; avoid other diseases as far as possible; and be temperate in all things.

Gaylord Bros.
Makers
Syracuse, N. Y.
PAT. JAN. 21, 1908

UNIVERSITY OF ILLINOIS-URBANA
3 0112 106758623